Jeremy Peach
Senior lecturer
University of Chester
Centre for Work Based Learning: Professional Development

Issues in learning in Higher Education Institutions:
Teaching, learning and technology; an e-route to deep learning?

Abstract

This paper details a research project that considered the extent to which e-learning is congruent with the notion of inculcating and maintaining deep approaches to learning within HE. Also, to explore what actions may be taken to engender and or maintain a deep approach when using e-learning as the central androgogy as knowing what (is possible) and how (it may be achieved) provides a fuller picture.

Whilst this paper is designed to help inform practice and professional judgement it is not purporting to provide absolute answers. Whilst I have attempted to provide an honest account of my findings, truth and reality are social constructions (Pring 2000). The research was based upon methodical triangulation and involved thirty-eight undergraduate students who are undertaking study through e-learning and five academic members of staff who utilise e-learning in their programmes. As such, the project was small scale and how much may be inferred as applicable to other groups and other contexts may be contested, as those sampled for this research have their own unique paradigms and perceptions. Finally, it is always worth remembering that effective teaching and learning is contextual (Pring 2000).

The research revealed that deep approaches to learning are situational (Biggs 2003) and e-learning can authentically lead to a student adopting and maintaining a deep approach.

There are several factors that increase the likelihood of a student adopting this desired approach. These include; where students perceive the programme to be of high quality (Parker 2004), they have feelings of competence and confidence in their ability to study and interact with the technology and others. In addition, students require appropriate, reliable access to technology, associated systems and individualised planned support (Salmon 2004). Further to this deep approaches are more likely to be adopted where programmes are built on a constructivist androgogy, constructive alignment is achieved, interaction at several levels and a steady or systematic style of learning are encouraged (Hwang and Wang 2004). Critically study

programmes should have authentic assessment in which deep approaches are intrinsic to their completion. To effectively support students in achieving a deep approach to learning, when employing e-learning, staff require knowledge and skill in three areas: teaching and learning, technology, and subject content (Good 2001). They also require support from leaders at cultural, strategic and structural levels (Elloumi 2004).

E-Learning and Higher Education

The use of computer technology is *"ubiquitous within the H.E. sector"* (Davies 2004 p97). This is in part engendered by such driving forces as the National Committee of Inquiry into Higher Education (1997), which promoted its use. The Department for Education and Skills (DfES) (DfES 2003) has driven the development of a collaborative policy, between the Higher Education Funding Council for England (HEFCE), the Higher Education Academy (HEA) and the Joint Information Systems Committee (JISC) (HEFCE 2005a) to further embed e-learning within HE over the next decade.

These developments may seem to be highly positive in that e-learning may help to increase the provision of education through its potential for mass information storage and distribution, the flexibility of delivery that it may offer and its potential to support the development of key skills (Soulells 2004). Conversely, and at the risk of being hailed as a neo-Luddite, I believe that we may be concerned that it is technological determinism, rather than an educational imperative.

Defining E-Learning

Whilst e-learning is a slippery concept to define the DfES (2003) assert that systems may incorporate a range of activities, tools and functions such as; content management and delivery, communications, assessment, student tracking and links into other systems such as a library, into a virtual learning environment (VLE). This integrates information systems around the students, who may be working in different modes at different times, on or off campus part or full time.

It is tempting to be seduced into thinking that ICT only involves personal computers other definitions help broaden thoughts to the use of a wider array of technologies. For example; telephone, the utilisation of text chat, video links, streaming audio, streaming video television, radio, tape, compact disk and digital video disk (Davies 2004).

Study programmes may incorporate technology as part of the provision, often referred to as *'blended learning'* which is the most common form of e-learning (Soulells 2004).

As such, the working definition adopted for of this research was:

"Where technology is used to access learning materials and obtain support during the learning process in order to acquire knowledge to construct personal meaning"

(Ally, 2004 p2)

In this definition Ally alludes to two critical issues. Technology is the medium. It is the instructional strategy not the technology that influences the quality of the learning. Learning is a human endeavour and technology, however flexible, seductive, powerful and useful, is not to be seen as either snake oil or the salvation of teaching and learning.

Ally raises the concept of constructivism, which, with the emphasis on the equal validity of individually constructed knowledge representations, is at the dynamic core of HE (Barbera 2004). Although, we should note that this view of HE is contested for example see the work of Laurillard (2002).

Higher Education, constructivism and Deep Learning

A constructivist androgogy proposes to answer the epistemological question by presenting the view that knowledge is constructed and maintained within the cognitive structures of each individual through a process of language, thought, and social interaction. It encourages students to critically explore their own thinking, knowledge, and understanding of the subject (Race and Brown 2001). It also proposes that meaning is not imposed on, but created by students.

Constructivism is congruent with Marton and Saljo's (1976) definition of deep learning:

> *"To comprehend the material and develop a critical understanding of the subject".* Marton and Saljo (1976 p8)

A deep learning approach uses the higher levels of Bloom's Taxonomy of cognitive domains (Bloom, Mesia and Krathwohl 1964) e.g. analysis, synthesis and evaluation. Whilst constructivism is the process a deep approach is the desired outcome.

Approaches to Learning

Approaches to Learning signify purposeful ways that students adopt. According to Tait, Entwistle, and McCune (1998) there are three approaches, which students may adopt in pursuance of their learning:

A Deep Approach focuses on understanding the meaning of study material and arises from a need to engage with learning and to seek understanding and meaning. This approach changes the way in which students understand or perceive the subject and its context.

A Strategic Approach highlights a pragmatic approach to study that some students adopt e.g. the focus of attention is on areas that directly correlate to the achievement of grades a student desires.

A Surface Approach concerns material being learned superficially without evidence of understanding and being able to reproduce the study material for the purposes of academic assessment. This approach involves students in low level cognitive activities such as rote learning and is only focused on the lower levels of Bloom's Taxonomy of cognitive domains (Bloom, Mesia and Krathwohl 1964).

Whilst some researchers talk of these approaches as if they were fixed and representing innate cognitive characteristics of a student, others such as Marton and Saljo (1984) assert that approaches to learning are highly context sensitive. These contexts include: the teaching climate, level of subject knowledge, perception of what a lecturer may require, the particular approach a student instructed or guided toward and whether the student considers a deep approach is inappropriate, for example what they perceive to be in an examination and how that is likely to be assessed (Biggs 2003).

There is evidence of a small proportion of learners who find difficulty in employing a deep approach, even in what researchers believe to be favourable contexts (Race and Brown 2001). Also, whilst students will have a range of approaches that they may be able to deploy, they will not proceed in a sequential fashion from using one approach to another (Higgins 2000) as in some form of Piagetian type development stage theory. Although in certain subject areas a base of knowledge may be necessary before understanding can be developed as such the idea of knowledge seeking always being inferior to seeking understanding is questionable (Brown, Bull and Pendlebury 1997).

Literature suggests that there are a range of factors that may encourage a deep approach:

Motivational Context: students' own internal motivation together with a positive climate, reflected in Biggs 'Level Three Teacher' (Biggs 2003)

Learner Activity: Deep learning is associated with activity rather than passivity.

Interaction with others: The opportunity to reflect and test learning with others.

Well-structured knowledge base: Learning material which is presented in an integrated way and which helps students to relate it to existing knowledge and experience.

The Research Plan

To enhance the validity and reliability of my research I included a duality of methods, qualitative (interviews) and quantitative (analysing Virtual Learning Environment (VLE) student usage data and structured questionnaires). This multi method approach can be complementary as one form (quantitative) can place structure to the research whilst the other (qualitative) may add richness and depth, (Cohen, Manion, and Morrison 2004). As such a form of methodological triangulation was adopted. The epistemology, which was at the heart of this project, was of non-positivism. This is to say that answers and the truth rest in determining how students are interpreting their actions and how this shapes their reality, (Wellington 2003).

The sample group for my research was thirty-eight undergraduate first year students who are undertaking an Honours Degree, in which a professional qualification is combined. The students were all undertaking this programme of study by e-learning. Five members of the University staff who teach on the programme also contributed to the research in the form of semi-structured interviews.

In stage one of the primary research exercise all students completed the ASSIST approaches to learning questionnaire, (Tait, Entwistle, and McCune 1998 pp. 262-270). Data relating to a students use of e-learning was provided through an analysis, of their activity when using the VLE and the responses they gave in interviews and a further questionnaire. The analysis of the data provided by the VLE had to be approached with some caution as it only tells a partial story. For example if a student logs onto the VLE for a shorter time period than a fellow student they may be still utilising the information equally, if not more.

To help the complexity of the analysis it was practicable to use a four point Likert Respondent Rating Scale. To avoid respondent confusion and aid my analysis each question adopted a uni-dimensional format and questions were presented in an order that grouped together particular themes.

I also conducted semi-structured interviews allowing me to probe different themes with different people as they arose.

The choice of students to interview (stage three) was based on forming a representative cross sample of different approaches to learning and diverse utilisation of e-learning, together with diverse paradigms of e-learning. From this information twenty five percent of students from each group were selected. This equated to eighteen deep learners, twelve surface learners and eight strategic learners.

The Statistical Package for Social Sciences (SPSS) was used to aid the interpretive analysis of part two of questionnaires. Data which emerged from the questionnaire's open question and the interviews were subject to a 'Categorical Analysis' (Lankshear and Knobel 2004).

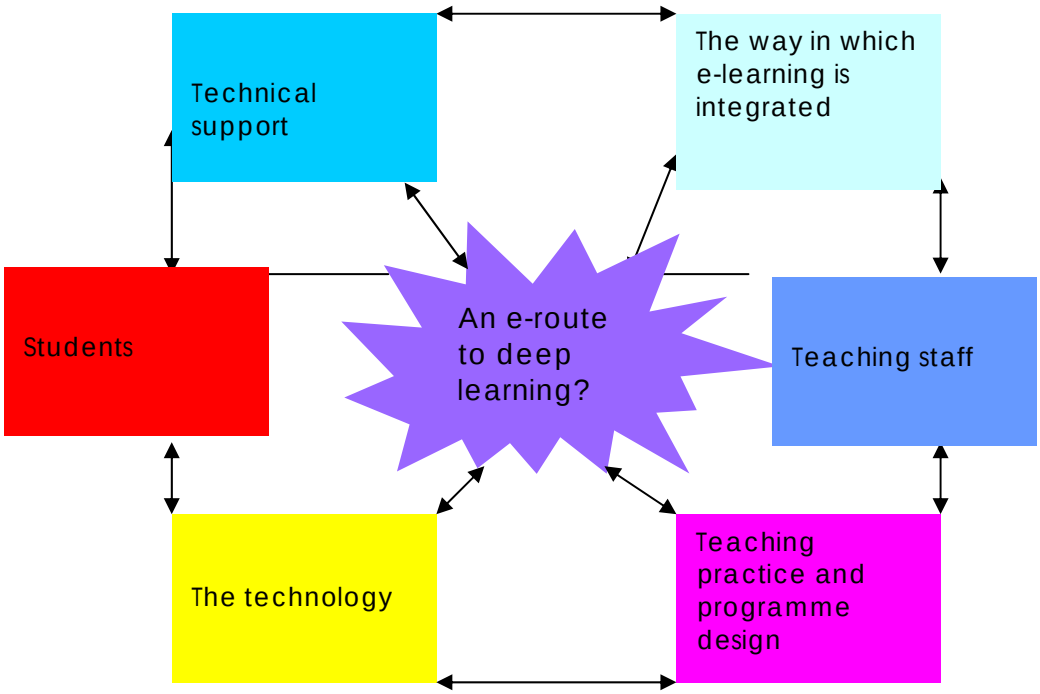
Results of the research

My research congruent with other researchers such as Shih and Gamon (2002) and Ernsti (2002) who suggested that e-learning is congruent with the notion of inculcating and maintaining deep approaches to learning. However, there is no magic learning formula and a number of elements need to be in place for this to exist. Deep approaches, as with any learning, are mediated by a range of situational factors that influence a person's motives and intentions (Biggs 2003).

E-learning, Constructivism and Deep Learning

There are several elements that impact on the question of whether e-learning is congruent with the notion of inculcating and maintaining deep approaches to learning. These are pictorially represented in six categories, shown in figure one:

Figure 1 A Systems Based Approach to the Taxonomy of Categories of issues that impact on the research question: an e-route to deep learning?



Clearly issues may span more than one category. Also, commensurate with systems theory, each element impacts on other parts. Each element includes the following issues, highlighted in figure two.

Programme Design and Constructive Alignment

To inculcate Deep Approaches attention should be given to the principles of effective programme design. A study programme should include dialogue, structured goals, activity, assessment aligned to a deep approach and the adoption of constructivist principles Ramsden (1992). Applying the principles of constructive alignment encourages deep approaches, which is the congruence of the learning objectives, content of the study, the androgogy and the assessment strategy (Biggs 2003).

Research suggests that when adopting e-learning engendering interaction at a variety of levels, particularly with peers, students were

more likely to adopt a deep approach (Hron and Friedrich 2002, Biggs 2003, Ally 2004).

Interaction

Knowledge construction is not an individual experience but a shared one (Prawlat and Floden 1994), interaction can reduce the feelings of isolation (Lynch 2001). Talking and discussing ideas and concepts with others is a powerful way of reflecting on and testing learning. It provides a means of negotiating and structuring meaning, which is more effective than solitary reflection alone and underpins the importance of cooperative and collaborative practices when utilising e-learning (Cross 2004).

However, it is the quality of the interaction that is the key in determining effective learning. Interaction must be more than a click of a mouse, the provision of endless quizzes and requiring a student to login on numerous occasions (Lynch 2001).

Whilst technologies may be tools for facilitating interaction they are not able to foster it and students are unlikely to interact and become involved in learning activities unless they perceive some personal benefit (Fox and Herrmann 1988). Interaction has to be intentionally incorporated into e-learning learning design, at both the technological and andrological levels. To this end my research suggested that assessment would play a key role as it drives learning.

There are many definitions of interaction. Figure two highlights nine levels, although it is worth noting that no hierarchy exits.

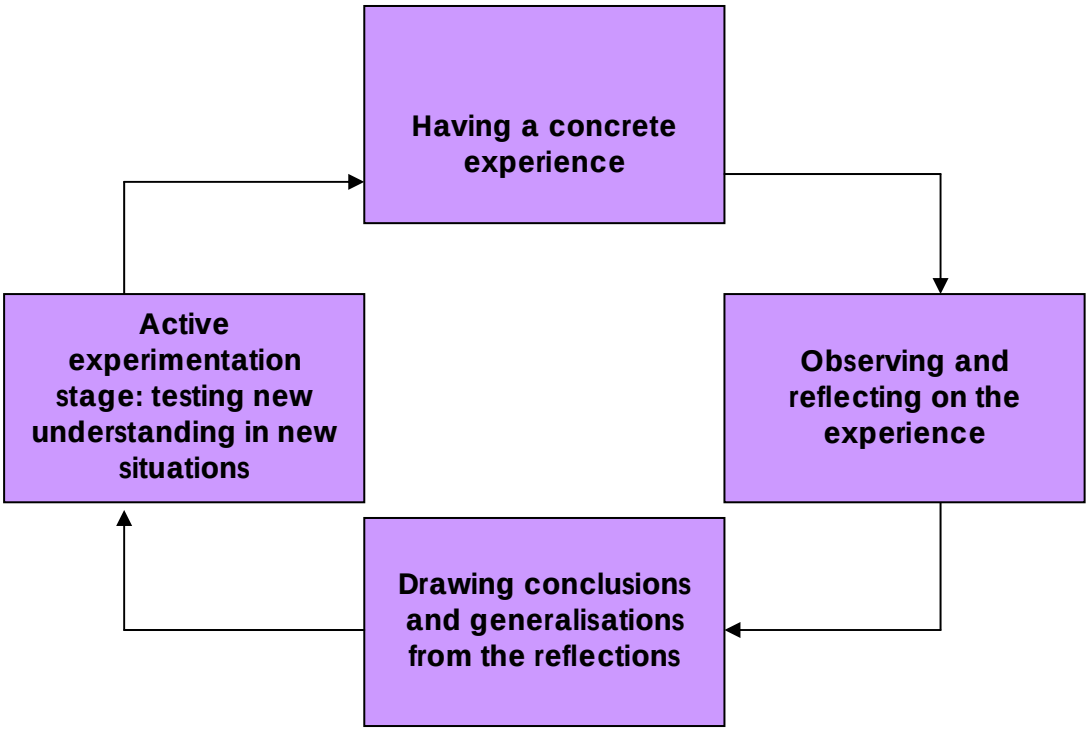
Figure 2: Nine Levels of Interaction, adapted from Lynch (2001) and Anderson (2004).

Interaction between:	
1	**A student and technology**
2	**A student and the content of learning material**
3	**The teacher and student(s)**
	A student and their peers

4	
5	**With self** (personal journals, reflective essays and reflective postings)
6	**With previous learning** (synthesising old knowledge and information with new).
7	**Between teacher and teacher** (update knowledge base)
8	**Between content and content of a VLE or MLE** (update and integrate data)
9	**Between teacher and content** (monitor content of study and update)

The notion of interaction dovetails with the advantages of problem-based learning. Additionally, interaction with self may be achieved through experiential learning as shown in figure three.

Figure 3: Cycle of experiential learning (Kolb 1984)



This model emphasises the cyclical and active nature of learning, with the activity of reflection being set in a context of learning. This requires students to change from actor to observer, by moving from specific involvement to general analytic detachment, through the process of self-observation and reflection.

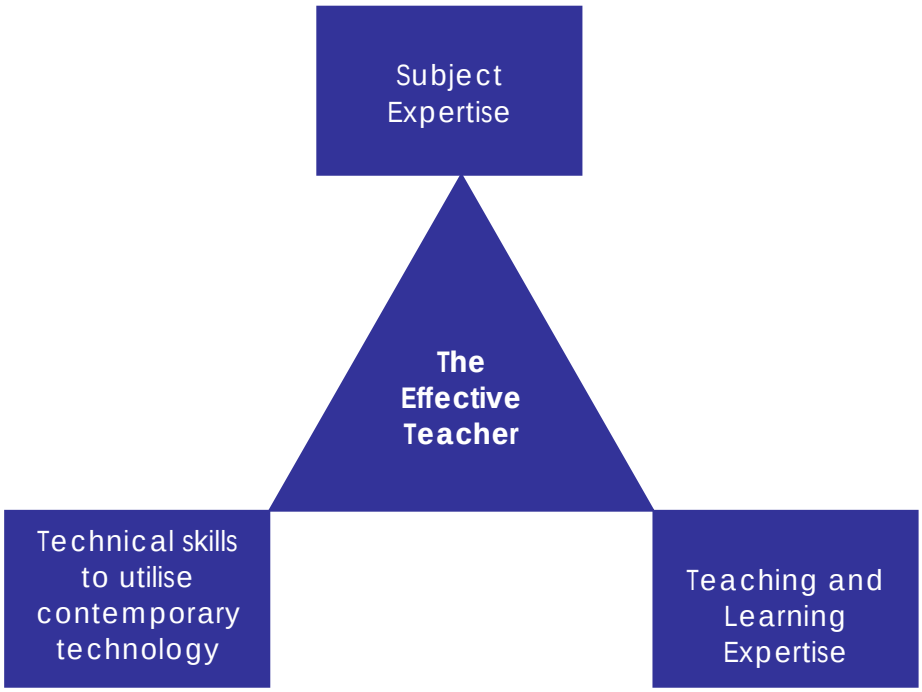
The interactions highlighted in levels three and four (of figure two) are related to the notions of Social Constructivist theory, which has its roots in Socratic Dialogue. This is a collective attempt to find the answer to a fundamental question (Neisser and Saran 2004). The question is applied to a concrete experience of one or more of the participants, which is accessible to all other participants. Systematic reflection upon this experience is accompanied by a search for shared judgements and reasons. A process not unlike Action Learning (McGill And Beaty 2000). When using technology to facilitate this form of interaction *"netiquette and civil discourse"* is required (Ugoretz 2004 p4).

Palloff and Pratt (1999) call for the tutors of e-learning programmes to develop a 'sense of community'. In response to the problems of isolation that may be present in e-learning, Harasim *et al* (1996) highlight the need to develop an online water cooler. This metaphor concerns the notion that people communicate more effectively informally (around the water cooler) than in formal meetings and emphaises the need to develop ways to support students' interaction away from the normal demands of their study, in addition to humanising a non-human learning environment.

Social interaction may not create itself and early experiences are vital as a student may struggle to find sense of time and place in the online learning environment (Salmon 2004). A programme of study is a social activity, which has at least two dimensions. Learning alongside others and learning in a social context. In encouraging students to enter dialogue and debate there is greater potential to engender and maintain a deep learning process (Chen, Wang and Ou 2003). Groups who have unsocial communication patterns have low group learning performance (Crook and Webster 1997). Students studying through e-learning, in a study by Rhodes and Doggart (2000), overwhelmingly highlighted the positive motivational effect that was produced by the high level of interaction.

Teachers have a key role, it is their creativity and pedagogical conception that can influence the adoption of deep approaches to learning (Mälinen 2001). If e-learning provides greater freedom for students there is a need for teachers to develop a repertoire of facilitative skills (Ryan et al 2000). The move may require a shift from teacher to student controlled learning and not simply the move toward online learning. Additionally, teachers require technical skills to fully support students and take full advantage of the technology (Batanov, Dimmittand and Chookittikul 2002). In essence teachers require knowledge and skills in three related areas, outlined in figure four.

Figure 4: Three areas of teacher knowledge and Skill



Together they, students and teachers, have to manage the transition between the cultural, social and learning environments on a personal level. In addition, as e-learning demands different skills and minds sets of students (Salmon 2004) teachers are required to help guide them through cultural change. However, teachers cannot bring about the required changes themselves (Davies 2004). Paradigms and cultures, both individually and organisationally, may need to change before this type of teaching and learning is accepted and the changing roles of all involved in e-learning are fully realised (Salmon 2004).

To achieve these changes staff need support from leaders at cultural, strategic and structural levels (Davies 2004). Unless e-learning is seen within the HEI as of integral value it is unlikely that it will be afforded the appropriate attention or recognition. At the strategic level both the vision and actions of leaders are required to realise these values and

aspirations. Leaders have to pay attention to structural elements, for example ensuring that synergy exits between IT and academic departments, staff have time and space in which to develop e-learning and their continuing professional development requirements are thought through (Littlejohn, Stefani and Sclater 1999).

Students

Students who manage their learning in a steady or systematic rather than a burst or intermittent style are more likely to adopt a deep approach (Hwang and Wang 2004). Although it should not be assumed that every browser is avoiding learning or adopting social loafing tendencies, they may not have the skill or equipment to access the technology sufficiently to become more actively involved.

Students may be unfairly denied access through poor design (Salmon 2004) for example where systems do not recognise valid logins or refuse access to online electronic resources due to the arbitrary end of term rules being applied incorrectly . The presentation of learning materials, support, system reliability and the systems ease of use, e.g. navigation and access to other learning resources play a significant role in the way a student perceives the quality of a programme and the approach to learning they adopt (Parker 2004).

Those who perceive themselves to have greater control take more responsibility for their learning and are more likely to adopt a deep approach. This is aided by a positive climate in which students are involved in the selection and planning of what is learned and how learning takes place (Rhodes and Doggart 2000, Colvin 2003)).

Much appears to rest with a student's perceptions and understandings, their competence and confidence in their study, which is influenced by prior experience, IT skills, and the socialisation processes undertaken within a programme (Ugoretz 2005).

Whilst we may have the play-station generation it should not be taken for granted that everyone is ICT literate or indeed enjoys or welcomes the benefits that technology may be seen to deliver. There are pragmatic issues that are crucial to resolve, for example; system knowledge, such as knowing how access and use programmes, access to technical equipment, connection speeds, the technical congruence of systems particularly for students working away from university settings, reliability of systems and technical support are all vital components. These issues are crucial to address when students are studying at a distance from the teaching staff as they are more

isolated and have greater feelings of vulnerability (Clarke 2004) and are more reliant upon their own technical equipment.

Whilst e-learning may aid access to learning for people with disabilities due the freedom of place, and time (Salmon 2004). Some may require specialised support to ensure they are not unfairly discriminated against, which is both a moral and legal requirement (United Kingdom Parliament 2000 Special Educational Needs and Disability Act 2000 and the Disability Rights Commission 2005).

Technology

Technology is capable of bringing together all the requirements of a student such as; access to library resources, to fellow students and teachers, outside of timetabled sessions in either synchronous or asynchronous communication. The ease of searching and access to a range of materials can provide time for students to gain more subject understanding and allow deep learning to take place (Yanni 2000).

Also technology can create and make available material in multi-media formats to cater for differing learning needs. It can provide visualisation, games and simulation tools to support highly specialised learning which traditional face-to-face teaching is not able to replicate.

In conclusion the following recommendations are made to aid the e-route to deep learning.

Recommendations

Institutional Level

Leaders of HEIs must ensure appropriate strategies, cultures and structures are in place to maximise the effectiveness of e-learning (Davis 2004). Strategies should be based upon detailed planning that addresses security issues to ensure the risk of system corruption is minimised (Whittington 1999), the availability of appropriate physical and financial resources such as hardware and software, HR capacity and that synergy exists between administrative practices, university policies, technical support and the online library resources .

Given that teaching and learning, by whatever methods, are human endeavours leaders have to pay attention to socio-cultural change to support e-learning within the university (Errington 2001). It is essential that ongoing CPD activities are available and utilised if cultural change is to be realised. In addition strategies have to create a healthy working environment with ways of ensuring limits on a teacher's time and that "*interaction fatigue"* (Mason 2001 p75) does not occur.

Institutional strategy should address the realities of political dynamics; all parts of the organisation have to be going in the same direction. To this end faculties or schools should be encouraged to develop technology plans that are integrated into the wider institutional strategy and which address local issues.

As faculties or schools may not have the appropriate resources to employ the wide range of technical skills that may be required, technical support should be both centralised and de-centralised. As such strategic support should be provided from the centre with operational support at a faculty or school level (Bates 2000).

Programme Level

Study programmes should be audited in respect of BS8426: A code of practice for e-support in e-learning systems (British Standard Institution 2003). This is to help ensure that programmes include constructive alignment, dialogue, activity, assessment aligned to a deep approach, constructivist principles and time for student reflection. Additionally, attention is given to the systems reliability and ease of use, e.g. navigation and both access to other learning resources and the accessibility of the links.

Given the propensity of some students to work in a burst state (Hwang and Wang 2004) and the role assessment has course teams should consider the integration of formative and summative continuous assessment (Anderson 2004). Additionally, given the impact of collaborative and cooperative androgogies (Salmon 2004) course teams should incorporate either collaborative or cooperative androgogies. It is particularly important that e-learning programmes contain interaction. As such expectations of interactive engagement should be included within programme learning outcomes and assessment.

On enrolment course teams should put into place systems that capture key information such as student's prior knowledge and skills concerning subject content, technology and online communication skills, in

addition to their level of access to technology suitable to meet the programme demands. From this information individualised plans may be developed and the HEI may wish to avail students who are undertaking study through distance learning with certain resources to aid their study. To aid readiness for e-learning all students should undertake an extensive induction programme. The cohort should engender online protocols. It is also important that where students are studying away from the university, due to the issues of studying in isolation, they have online access to university support staff.

Staff should be encouraged to avail themselves of CPD activities in respect of their IT knowledge and skills and facilitative skills. Additionally, given the benefits offered by Peer Observation of Teaching (POT) faculties/schools should develop schemes in respect of e-learning. Further to this where institutions have schemes for the accreditation of HE teaching staff, a module should be integrated that specifically addresses e-learning and which also forms part of the assessment requirements for the programme.

Further Research

E-learning is dynamic and continuously developing. As such I believe that the following areas of research will further our knowledge base.

Given the positive impact of collaborative and cooperative learning and the difficulties of assessing these androgogies within HE, research should be conducted that focuses on how this may be effectively conducted.

As e-learning can provide access to global resources and given the notion of globalisation within education (Biggs 2003) research may be conducted that looks at how strategic alliances and educational networks across HEI's may be engendered.

As the notion of a traditional university student becomes more remote and given the agenda for widening participation (HEFCE 2005b), research into the needs of non traditional students when using e-learning would be highly beneficial.

Summary:

Approaches to learning are contextual and signify both the learner's intention and the way in which s/he processes information. However, there is evidence to support the notion that e-learning can produce learning outcomes at least equivalent to those achieved through classroom and face to face activities and engender deep learning.

Whilst there are specific technological issues to resolve as with any traditional programme attention needs to be paid to the following six elements: culture, strategy, technology, programme design, individual perceptions, competence and support needs of staff and students. As such leaders and teachers must develop appropriate strategies, cultures and structures at the macro, messo and micro levels if the benefits that e-learning can offer are to be realised.

List of References

Ally, M. 2004. Foundations of Educational Theory for Online Learning. In T. Anderson and F. Elloumi (eds.). 2004. **Theory and Practice of Online Learning.** Athabasca, Canada: Athabasca University. Pp 3 – 30.

Anderson T. 2004. Toward a Theory of Online Learning. In T. Anderson. and F. Elloumi (eds.). **Theory and Practice of Online Learning.**

Biggs, J. 2003. **Teaching for Quality Learning at University.** Second Edition. Maidenhead, Berkshire: Society for Research into Higher Education (SRHE) and Open University Press.

Barbera, E. 2004. Quality in Virtual Environments. **British Journal of Educational Technology.** Volume 32, Number 1, pp 13 – 20.

Batanov, D. N, Dimmitt, N. J. and Chookittikul, W. 2002. Developing and Educational Software Framework for Distance-less Learning. **Journal of Computer Assisted Learning.** Number 18, pp 188 – 198.

Bates A. W. 2000. **Managing Technological Change: Strategies for college and university leaders**. San Francisco: Jossey-Bass.

Bloom, B. S., Mesia, B. B. and Krathwohl, D. R. 1964. **Taxonomy of Educational Objectives; The Affective Domain and The Cognitive Domain.** New York: David McKay.

British Standard Institution. 2003**. BS8426:2003 A Code of Practice for E-support in E-learning Systems.** [Online], British Standard Institution. URL http://www.bsi-global.com [Accessed: 7th December 2003].

Brown, G., Bull, J. and Pendlebury, M. 1997. **Assessing Student Learning in Higher Education.** London: Routledge.

Chen, G., D., Wang, C. Y. and Ou, K. L. 2003. Using Group Communication to Monitor Web-based Group Learning. **Journal of Computer Assisted Learning.** Number 19, pp 401 - 415.

Clarke, A. 2004. **E-Learning Skills.** Basingstoke: Palgrave.

Cohen, L. Manion, L and Morrison K. 2004. **Research Methods in Education.** 5th Edition. London: Routledge Falmer.

Colvin, J. 2003. Extending the Academic Year for Mature Part-time Higher Education Students using a Web-based Learning Environment. **Research in Post Compulsory Education.** Volume 8, number 3, pp 393 – 405.

Crook, C. and Webster, D. S. 1997. Designing for Informal Undergraduate Computer Mediated Communication. **Active Learning.** Number 7, December pp 1 – 5.

Cross, F. 2004. An Informal History of E-learning. **On the Horizon.** Volume 12, number 3, pp 103 – 110.

Davies, A. 2004. Developing an Infrastructure for Online Learning. In T. Anderson. and F. Elloumi (eds.). **Theory and Practice of Online Learning.** Athabasca, Canada: Athabasca University. 2004, pp 97 – 114.

Department for Education and Skills (DfES). 2003**. Towards a Unified e-learning Strategy.** [Online], DfES. URL> http://www.dfes.gov.uk/elearning [Accessed: 1 January 2005].

Disability Rights Commission. 2005. **Disability Discrimination Act - What does it mean?** [Online] Disability Rights Commission. URL> http://www.drc-gb.org/thelaw/thedda.asp. [Accessed: 8th January 2005].

Elloumi, F. 2004. Value Chain Analysis: A strategic approach to online learning. In T. Anderson and F. Elloumi (eds.). 2004. **Theory and Practice of Online Learning.** Athabasca, Canada: Athabasca University. Pp 31 – 42.

Ernsti, F. 2002. The effect of Individual Difference Variables, Learning Environment and Cognitive Task on Statistical Learning Performance. **The American Journal of Distance Education.** Volume 3, number 4, pp 10 – 22

Fox, R. and Herrmann, A. 1998. Communicating Through Computers: Changing teaching, changing times? In: C. Rust, C. (ed.). **Improving Student Learning.** Oxford: The Oxford Centre for Staff and Learning Development, Oxford Brookes University. 1998, pp 558- 563.

Good, M. 2001. On the Way to Online Pedagogy. In J. Stephenson (ed). **Teaching and Learning Online: New pedagogies for new technologies**. London: Kogan Page. 2001 pp 165 – 174.

Harasim, L., Hiltz, S R., Teles, L. and Turoff, M. 1996. **Learning Networks.** Cambridge, Massachusetts: MIT press.

Higgins, R. A, 2000. **"59% - Excellent". Making sense of Assessment feedback.** [Online], Institute for Learning and Teaching in Higher Education, Learning and Teaching Institute, Sheffield Hallam University. Public Resources: ILTAC 2000: Session 1/054 index. URL http://www.ilt.ac.uk/iltac2000/higgins/default.htm> [Accessed: 10th July 2002].

Higher Education Funding Council for England (HEFCE). 2005a. **Strategy for E-learning.** [Online], HEFCE URL> http://www.hefce.ac.uk/pubs/hefce/2005/05_12/05_12.doc [Accessed: 1st May 2005].

Higher Education Funding Council for England (HEFCE). 2005b. HEFCE Strategic Plan 2003- 2008. Revised April 2005. **[Online], HEFCE. URL> http://www.hefce.ac.uk/pubs/hefce/2005/05_16/#fore [Accessed: 20th July 2005].**

Hron, A. and Friedrich, H. F. 2002. A Review of Web-based Collaborative Learning: factors beyond technology. **Journal of Computer Assisted Learning.** Number 19, pp 70 – 79.

Hwang, W. and Wang, C. 2004. A Study of Learning Time Patters in Asynchronous Learning Environments. **Journal of Computer Assisted Learning.** March, number 20, pp 292 – 304.

Kolb, D. 1984. **Experiential Learning as the Science of Learning and Development.** Englewood Cliffs New Jersey: Prentice Hall.

Laurillard, D. 2002. **Rethinking University Teaching: A conversational framework for the effective use of learning technologies.** Second edition. London: Routledge Farmer.

Lankshear, C., and Knobel, M. 2004. **A Handbook for Teacher Research: From design to implementation.** Maidenhead: Open University Press, McGraw Hill Education.

Littlejohn, A., Stefani, L.., and Scalter, N. 1999. Promoting Effective Use of Technology, the Pedagogy and the Practicalities: A case study. **Active Learning.** Number 11, December.

Lynch, M. 2001. **The Online Educator : A guide to creating the virtual classroom.** London: Routledge Falmer.

Mällinen, S. 2001. Teacher Effectiveness and Online Learning. In J. Stephenson (ed.). **Teaching and Learning Online; Pedagogies for new technologies.** London: Kogan Page. Pp 139 – 150.

Marton, F. and Saljo, J. 1976. On qualitative differences in learning 1: Outcome and Process. **British Journal of Educational Psychology**. Volume 46, pp 4-11.

Mason, R. D. 2001, Effective facilitation of online learning: the Open University experience. In: In J. Stephenson (ed). **Teaching and Learning Online: New pedagogies for new technologies.** London: Kogan Page. 2001, pp 67 – 76.

McGill, I . and Beaty, L. 2000. **Action Learning; A practitioner's guide.** London: Routledge Farmer

Neisser, B. and Saran, R. 2004. **Enquiring Minds: Socratic Dialogue in education.** Stoke on Trent: Trentham Books.

Palloff, R. M. and Pratt, K. 1999. **Building Learning Communities in Cyberspace: Effective strategies for the online classroom.** San Francisco: Jossey-Bass.

Parker, N. K. 2004. The Quality Dilemma in Online Education. In T. Anderson. and F. Elloumi (eds.). **Theory and Practice of Online Learning.** Athabasca, Canada: Athabasca University.

Prawlat, R. S. and Floden, R. E. 1994. Philosophical Perspectives on Constructivist Views of Learning. **Educational Psychologist.** Volume 29, number 1, pp 37 – 48.

Pring, R. 2000. **Philosophy of Educational Research.** London: Continuum.

Race P., and Brown, S., 2001. **The ILT A Guide: Inspiring Learning about Teaching and Assessment.** York: Institute for Learning and Teaching in Higher Education in association with EducationGuardian.co.uk.

Ramsden, P. 1992. **Learning to Teach in Higher Education**. London: Routledge.

Rhodes, C. and Doggart, L. 2000. Learning at a Distance in Higher Education: An evaluation of a CD-ROM-based distance learning project with the royal Air Force. **Research in Post Compulsory Education.** Vol. 5, Number 2, pp 44 – 54.

Ryan, S, Scott, B., Freeman, H. and Patel, D. 2000**. The Virtual Learning University: The Internet and resource-based learning.** London: Kogan Page.

Salmon, G. 2004. **E-Moderating; The key to teaching and learning online.** Second edition. London: Routledge Falmer.

Shih, C. and Gamon, J. A. 2002. Relationships Among Learning Strategies, Patterns, Styles and Achievement in Web Based Courses. **Journal of Agricultural Education.** Volume 43, number 4. pp 14 – 24

Soulells, N. 2004**. A prescriptive study of early trends in implementing e-learning into the UK Higher Education.** [Online], Learning Circuits. URL> http://it.coe.uga.edu/itforum/paper78/paper78.htm [Accessed: 29th October 2004].

Tait, H., Entwistle, N.J. and McCune, V. 1998. "ASSIST: A reconceptualization of the approaches to studying inventory", In: C. Rust, (ed.). **Improving Student Learning.** Oxford: The Oxford Centre for Staff and Learning Development, Oxford Brookes University.

Ugoretz, J. 2005. **"Two Roads Diverged in a Wood": Productive Digression in Asynchronous Discussion.** [Online], Innovate: Journal of Online Learning. Florida: Nova South Eastern University. February/March, Volume 1, Issue 3. URL> http://innovateonline.info/index.php?view=article&id=30 [Accessed: 2nd February 2005].

United Kingdom Parliament. 2000**. Special Educational Needs and Disability Bill [H.L.].** [Online] United Kingdom Parliament. URL> http://www.parliament.the-stationery-office.co.uk/pa/ld200001/ldbills/003/2001003.htm [Accessed: 20th January 2005].

Wellington, J. 2003. **Educational Research; Contemporary issues and practical approaches.** London: Continuum.

Whittington, D. 1999. Technical and Security Issues. In S. Brown, P. Race and J. Bull (eds.). **Computer Assisted Assessment in Higher Education**. London: Kogan Page. Pp 21 – 28

Yanni. M. 2000. Technology Is Us: Do we have time to learn? **Technology Trends.** Volume 44, number 4, pp 42 – 53.

Jeremy Peach